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first employing means for employing data mining algorithms to generate input data for forming the set of spatial relationships.

25. The data processing system of claim 24 further comprising:
second employing means for employing spatial analysis algorithms to form the set of spatial relationships.
26. The data processing system of claim 24 further comprising:
fourth identifying means for identifying patterns of customers and locations of products within the retail space comprises using a position identifying system.

REMARKS

Claims 1-30 are pending in the present application. Claims 1, 6, 14, 15, 16, 21, 29, and 30 were canceled; claims 2-5, 7-11, 17-20, 22, and 24-26 were amended. Claims 2, 9, 17, and 24 were amended only to include the limitations of their respective independent claims. The scope of Claims 2, 9, 17, and 24 has not been altered by these amendments. The other claims which depended from cancelled Claims 1, 6, 16, and 21 now properly depend from claims 2, 9, 17, and 24, respectively. Reconsideration of the claims is respectfully requested.

I. 35 U.S.C. § 102, Anticipation

The examiner has rejected claims 6-15, 21-27, 29 and 30 under 35 U.S.C. § 102(e) as being clearly anticipated by Hughes et al., patent number 5,920,261.

With regard to claims 6-15, 21-27, 29 and 30, the Office Action states:

Hughes et al. teaches determining data relationships including determining locations of products, recording paths of customers, identifying products chosen for purchase, and associating the locations of products with the paths of customers as claimed (see at least col. 1, line 40 – col. 2, line 55, col. 6, line 1 – col. 60, col. 12, lines 1-20, col. 13, lines 25-55, col. 15, lines 15-50, col. 16, line 40 – col. 17, line 50, col. 18, lines 15-40, col. 20, lines 25-65).

This rejection is respectfully traversed.

The Examiner cites several passages of Hughes et al. in rejecting the claims of the present application. The Examiner cites these several passages without indicating how any of them are relevant or what limitation of the present invention each is purported to teach.

One function of the *prima facie* burden is to require the Patent Office to set forth specific objections, which can be met by the applicant, and not just make general rejections. *In re Epstein*, 32 F.3d 1559, 31 USPQ2d 1817, 1820 (Fed. Cir. 1994) (Plager, J., concurring). "The Examiner cannot sit mum, leaving the applicant to shoot arrows into the dark hoping to somehow hit a secret objection harbored by the Examiner." *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443, 1447 (Fed. Cir. 1992) (Plager, J., concurring).

Though the Applicant has attempted to anticipate which of the cited passages are intended to teach which limitations of the present inventions, it is respectfully requested that the Examiner provide more specific rejections if the Applicant has inadvertently misapplied or misinterpreted the relevance of one of the Examiner's cited references.

In rejecting Claims 6-15, 21-27, 29, and 30, the Examiner cites col. 1, ll. 40-col.2, ll. 55. This section of the reference appears to describe a system for tracking objects, but does not mention employing data mining algorithms to generate input data for forming the set of spatial relationships, as claimed in Claims 9 and 24.

Claim 9 is reproduced below, for reference:

9. A method for determining data relationships of data associated with product placement in a retail space, the method comprising the computer-implemented steps of:

identifying patterns of customers in the retail space;
style="padding-left: 40px;">identifying locations of products within the retail space; and
style="padding-left: 40px;">associating the patterns of customers with the locations of products to form a set of spatial relationships; and
style="padding-left: 40px;">employing data mining algorithms to generate input data for forming the set of spatial relationships.

This claim includes a limitation of, "employing data mining algorithms to generate input data for forming the set of spatial relationships."

The Examiner also cites col.6, -col.60. (It is assumed the Examiner refers to col. 6, ll. 1-60; however, if this assumption is in error, it is respectfully requested that such error be pointed out with particularity.) This passage appears to teach using transponders to monitor objects within a space, including the recording of other attributes of the objects such as model number, cost, etc. This passage does not appear to teach the use of data mining algorithms to generate input for forming a set of spatial relationships, as claimed in at least Claims 9 and 24.

Next the Examiner cites col. 12, ll. 1-20. This passage appears to teach that an object's orientation can be determined with the use of multiple transponders on an object, along with an alarm to be sounded if the object's orientation is determined to be incorrect (e.g., upside down). This passage does not appear to mention data mining or the use of data mining algorithms to produce input for forming a set of spatial relationships, as claimed in at least Claims 9 and 24.

The Examiner also cites col. 13, ll. 25-55. This section appears to teach how a processor determines position of objects equipped with transponders, and how to overcome uncertainties in object location. The passage does not appear to be related to the use of data mining algorithms.

The Examiner further cites col. 15, ll. 15-50, which appears to teach motion detection and tracking of objects in motion using the disclosed system. This passage does not appear to teach the use of data mining algorithms to create input for forming a set of spatial relationships, as claimed.

The Examiner also cites col. 16, ll. 40-col.17, ll. 50. These paragraphs appear to teach measuring and analyzing overall facility performance with, among other things, "mining tools." A relevant passage states:

The Analyst tool offers users a variety of advanced data visualization, decision making and mining tools for measuring and analyzing overall facility performance. It allows a manager to quickly see which parts, for example, in retail, which departments of a store are performing well and which are not with respect to a variety of performance measures. These measures could include total profit, profit per area, and so on. The analyst tool also offers users a variety of

advanced data visualization, decision making, and mining tools for measuring and analyzing micro-level data, for example, SKU (stock keeping units), colors, patterns, and styles and for analyzing overall enterprise performance. It allows a centralized manager to quickly see how stores are performing within a particular region." [Col. 17, ll. 6-19.]

Other applications of these software tools are also mentioned:

In a first application the system provides a method for associating a value (e.g., an economic or safety value) to space. In other words, it provides a method for assigning a value to an object based solely on its location in space. This is made possible by cross relating object location data to other data (e.g., mapping 3DPOS data to a POS data set). For example, in predicting the potential profitability of particular merchandise items in a store, one would consider where the items were located and assign a location value to the items in each location, since it is known that items placed in a high traffic area would have a greater chance of being sold as opposed to items placed in a low traffic area. [Col. 17, ll. 31-42.]

These passages mention the use of mining tools for measuring and analyzing overall system performance, but do not appear to mention, suggest, or otherwise teach the use of data mining to provide input data for generating a set of spatial relationships, as claimed by at least Claim 9.

The examples used include measuring and analyzing overall facility performance, total profit, profit per area, monitoring SKU of objects, color, patterns, and styles, and assigning a value to an object based on its location.

Assigning a value to an object based on its location is not equivalent to the use of data mining to produce input for creating a set of spatial relationships between customer patterns and object locations. In discussing how to assign values to objects based on location, the reference states that, "This is made possible by cross relating object location data to other data (e.g., mapping 3DPOS data to a POS data set)." The 3DPOS data refers to the system for keeping track of objects in the store, as indicated at col. 4, ll. 10-28, etc.

It is respectfully asserted that these passages do not include the use of customer patterns within the store. Since the reference does not mention tracking customer patterns within a store in the context of analysis using data mining, and since none of the example uses of data mining suggest using data mining results as input for forming a set of spatial relationships between customer patterns and object locations, it is respectfully asserted

that the cited passages of Hughes do not teach " associating the patterns of customers with the locations of products to form a set of spatial relationships; and employing data mining algorithms to generate input data for forming the set of spatial relationships," as claimed.

The relevance to data mining in the context of the present application is demonstrated by the following passages from the application.

"Businesses constantly desire a better understanding of a customer's buying habits in a retail establishment, and data mining has been used in an attempt to discover relationships between customers and purchases. One class of relationships for which a business desires guidance is the relationship between product placement and the choice of products for purchases by the customers of the business, which may own several databases from which such relationships could be extracted if the proper methodologies could be applied. However, data mining analysis heretofore has been concerned primarily with relationships between customer characteristics and product characteristics and not the relationships between customers and the placement of products within a retail environment." [p. 2, l. 20-p.3, l. 2.]

"The products chosen for purchase by the customers are identified, and the locations of the chosen products within the retail space are associated with the paths of the customers through the retail space to form a set of spatial relationships. Data mining algorithms are used to generate input data for forming a set of product and customer relationships. The spatial analysis techniques of GIS, combined with the location technologies of GPS, LPS, and EGPS, are used to formulate and capture the set of spatial relationships." [p. 4, ll. 14-29, emphasis added.]

"Data mining systems, on the other hand, can build a set of high-level rules about a set of data, such as "If the purchaser is a student and between the ages of 16 and 21, then the probability of buying a compact disk is eighty percent." Such rules allow a manager to make queries, such as "Which customers have the highest probability of buying a compact disk?" This type of knowledge allows for targeted marketing of products and helps to guide other strategic business decisions." [p. 9, ll. 18-27, emphasis added.]

These passages show advantages to the use of data mining. For example, the rule building capability of the data mining systems have the advantage of allowing more abstract queries to be formed, and which can be more easily answered by the vast amount of collected data using data mining than a manual search for such relationships. These

capabilities are apparently not shown in the passages cited by the Examiner, and it is therefore respectfully asserted that the cited references do not teach all claimed limitations of the rejected claims.

The office action also cites col. 18, ll. 15-40. This passage (referenced above) states that the system of Hughes can also be used to track a customer's path through a store. Data mining is not mentioned in this context or this citation.

The rejection also cites col. 20, ll. 25-65. This passage again mentions cross relating object data with traffic data to obtain "values" for objects based on location. These "value quanta" are said to be based on traffic movement, or the sale of objects from a particular location.

None of these passages appear to mention, suggest, or otherwise indicate the use of data mining algorithms to generate input data for forming the set of spatial relationships, as claimed in at least Claims 9 and 24. If the Applicant has overlooked a relevant teaching, it is respectfully requested that such teaching be pointed out with particularity.

Similarly, none of the cited passages appear to teach or mention the use of spatial analysis algorithms to form the set of spatial relationships, as claimed in Claims 10 and 25.

Since the claims previously depending from Claim 6 have been amended to depend from Claim 9 (which includes a data mining limitation), and since the claims previously depending from Claim 21 have been amended to depend from Claim 24 (which includes a data mining limitation), it is respectfully urged that these claims are not shown by the cited reference and are in condition for allowance.

II. 35 U.S.C. § 103, Obviousness

The examiner has rejected claims 1-5, 16-20 under 35 U.S.C. § 103(a) as being unpatentable over Hughes et al., patent number 5,920,261 in view of Abell, WO 98/38589. This rejection is respectfully traversed.

With regard to claims 1-5, 16-20, the Office Action states:

Hughes substantially teaches the invention as shown above, but does not teach identifying customers within a retail space. Abell teaches identifying customers within a retail space (see at least pp. 3-6, 9-10, 21). It would have been obvious to one having

ordinary skill in the art at the time of the invention to have sued the customer identification of Abell in the system of Hughes since the customer identification would have aided in the floor plan of items of Hughes to plan the location of items in the store based upon the customers or class of customer who is most likely to see an item as suggested by Abell.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes, patent number 5,920,261 in view of Fano, patent number 6,317,718.

Hughes substantially teaches the invention as shown above, but does not teach use of gps. Fano teaches determining shopper location using gps (see at least abstract, col. 2, lines 20-40). It would have been obvious to one having ordinary skill in the art at the time of the invention to have used the gps of Fano in the location determination of Hughes since the gps receiver offers the advantage of not requiring special equipment over the store as suggested by Fano or since the gps would have offered user assistance in indentifying locations of desired items.

In rejecting Claims 1-5, and 16-20, the Examiner cites Hughes, in view of Abell, WO 98/38589 at pp. 3-6, 9-10, and 21 as teaching identifying customers in a retail space.

However, as argued above, it is respectfully asserted that neither Abell nor Hughes appears to teach the use of data mining algorithms to generate input data for forming the set of spatial relationships, as claimed in Claims 2 and 17. Applicant has not found any reference within the cited passages to data mining, and therefore respectfully requests that the presently pending claims be favorably reconsidered.

III. Conclusion

It is respectfully urged that the subject application is patentable over Hughes, and over Hughes in view of Abell, and is now in condition for allowance.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

DATE: 6. 9.02

Respectfully submitted,



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Redacted Claims

2. A method for determining data relationships of data associated with product placement in a retail space, the method comprising the computer-implemented steps of:
determining locations of products within the retail space using a position identifying system;
identifying customers within the retail space;
recording paths of customers through the retail space using the position identifying system;
identifying products chosen for purchase by the customers during the paths of the customers through the retail space; and
associating the locations of products within the retail space with the paths of the customers through the retail space to form a set of spatial relationships; and [The method of claim 1 further comprising:]
employing data mining algorithms to generate input data for forming the set of spatial relationships.
3. The method of claim 2 [1] further comprising:
employing spatial analysis algorithms to form the set of spatial relationships.
4. The method of claim 2 [1] wherein the position identifying system comprises a global positioning system or other remote sensing device.
5. The method of claim 2 [1] wherein the position identifying system comprises a local positioning system that may or may not be associated with a global positioning system.
7. The method of claim 9 [6] further comprising:
selecting locations for products in the retail space based on the set of spatial relationships.

8. The method of claim 9 [6] further comprising:
 - identifying locations of products relocated within the retail space based on the selected locations; and
 - associating the patterns of customers with the locations of relocated products to form a second set of spatial relationships.
9. A method for determining data relationships of data associated with product placement in a retail space, the method comprising the computer-implemented steps of:
 - identifying patterns of customers in the retail space;
 - identifying locations of products within the retail space; and
 - associating the patterns of customers with the locations of products to form a set of spatial relationships; and [The method of claim 6 further comprising:]
 - employing data mining algorithms to generate input data for forming the set of spatial relationships.
10. The method of claim 9 [6] further comprising:
 - employing spatial analysis algorithms to form the set of spatial relationships.
11. The method of claim 9 [6] further comprising:
 - identifying patterns of customers and locations of products within the retail space comprises using a position identifying system.
17. A data processing system for determining data relationships of data associated with product placement in a retail space, the data processing system comprising:
 - determining means for determining locations of products within the retail space using a position identifying system;
 - first identifying means for identifying customers within the retail space;
 - recording means for recording paths of customers through the retail space using the position identifying system;
 - second identifying means for identifying products chosen for purchase by the customers during the paths of the customers through the retail space; and

associating means for associating the locations of products within the retail space with the paths of the customers through the retail space to form a set of spatial relationships; and [The data processing system of claim 16 further comprising:]

first employing means for employing data mining algorithms to generate input data for forming the set of spatial relationships.

18. The data processing system of claim 17 [16] further comprising:

second employing means for employing spatial analysis algorithms to form the set of spatial relationships.

19. The data processing system of claim 17 [16] wherein the position identifying system comprises a global positioning system.

20. The data processing system of claim 17 [16] wherein the position identifying system comprises a local positioning system.

22. The data processing system of claim 24 [21] further comprising:

selecting means for selecting locations for products in the retail space based on the set of spatial relationships.

24. A data processing system for determining data relationships of data associated with product placement in a retail space, the data processing system comprising:

first identifying means for identifying patterns of customers in the retail space;
second identifying means for identifying locations of products within the retail space; and

first associating means for associating the patterns of customers with the locations of products to form a set of spatial relationships; and [The data processing system of Claim 21, further comprising:]

first employing means for employing data mining algorithms to generate input data for forming the set of spatial relationships.

25. The data processing system of claim 24 [21] further comprising:
second employing means for employing spatial analysis algorithms to form the set of spatial relationships.

26. The data processing system of claim 24 [21] further comprising:
fourth identifying means for identifying patterns of customers and locations of products within the retail space comprises using a position identifying system.